

CLAIMS

1. A decoding device for decoding a coded stream, the device comprising:
 - a plurality of decoding means for decoding the coded stream; and
 - decoding control means for controlling the plurality of decoding means to operate in parallel.
2. The decoding device as claimed in claim 1, wherein the plurality of decoding means output a signal indicating the end of decoding processing to the decoding control means, and
 - the decoding control means controls the decoding means which outputted the signal indicating the end of decoding processing, to decode the coded stream.
3. The decoding device as claimed in claim 1, further comprising:
 - first buffer means for buffering the coded stream;
 - reading means for reading out a start code indicating the start of a predetermined information unit included in the coded stream from the coded stream and reading out position information related to the position where the start code is held to the first buffer means;
 - second buffer means for buffering the start code and the position information read out by the reading means; and
 - buffering control means for controlling the buffering of the coded stream by the first buffer means and the buffering of the start code and the position information by

the second buffer means.

4. The decoding device as claimed in claim 1, wherein the coded stream is an MPEG2 coded stream prescribed by the ISO/IEC 13818-2 and the ITU-T Recommendations H.262.

5. The decoding device as claimed in claim 1, further comprising:

selecting means for selecting predetermined picture data of a plurality of picture data decoded and outputted by the plurality of decoding means; and

motion compensation means for receiving the picture data selected by the selecting means and performing motion compensation, if necessary.

6. The decoding device as claimed in claim 5, wherein the decoding means outputs an end signal indicating that decoding processing has ended to the selecting means, and

wherein the selecting means has storage means for storing values corresponding to the respective processing statuses of the plurality of decoding means,

changes, from a first value to a second value, the values stored in the storage means corresponding to the decoding means outputting the end signal indicating that decoding processing has ended, when all the values in the storage means are the first value,

selects one of the picture data decoded by the decoding means for which the corresponding values stored in the storage means are the second value, and

changes the value stored in the storage means corresponding to the decoding

means which decoded the selected picture data, to the first value.

7. The decoding device as claimed in claim 5, further comprising:

holding means for holding the picture data selected by the selecting means or the picture data on which motion compensation is performed by the motion compensation means; and

holding control means for controlling the holding, by the holding means, of the picture data selected by the selecting means or the picture data on which motion compensation is performed by the motion compensation means.

8. The decoding device as claimed in claim 7, wherein the holding means separately holds a luminance component and color-difference components of the picture data.

9. The decoding device as claimed in claim 7, further comprising change means for changing the order of frames of the coded stream supplied to the decoding means,

wherein the holding means can hold at least two more frames than the number of frames obtained by totaling intra-coded frames and forward predictive coded frames within a picture sequence, and

the change means can change the order of frames of the coded stream so as to make a predetermined order for reverse reproduction of the coded stream.

10. The decoding device as claimed in claim 9, further comprising output means for reading out and outputting the picture data held by the holding means,

wherein the predetermined order is an order of intra-coded frame, forward

predictive coded frame, and bidirectional predictive coded frame, and the order within the bidirectional predictive coded frame is the reverse of the coding order, and

the output means sequentially reads out and outputs the bidirectional predictive coded frames decoded by the decoding means and held by the holding means, and reads out the intra-coded frame or the forward predictive coded frame held by the holding means, at predetermined timing, and inserts and outputs the intra-coded frame or the forward predictive coded frame at a predetermined position between the bidirectional predictive coded frames.

11. The decoding device as claimed in claim 10, wherein the predetermined order is such an order that an intra-coded frame or a forward predictive coded frame of the previous picture sequence decoded by the decoding means is held by the holding means at the timing when the intra-coded frame or the forward predictive coded frame is outputted by the output means.

12. The decoding device as claimed in claim 9, further comprising:
recording means for recording necessary information for decoding the coded stream; and

control means for controlling the recording of the information by the recording means and the supply of the information to the decoding means;

wherein the coded stream includes the information, and

the control means selects the necessary information for decoding processing by the decoding means and supplies the necessary information to the decoding means.

13. The decoding device as claimed in claim 12, wherein the information supplied to the decoding means by the control means is an upper layer coding parameter corresponding to a frame decoded by the decoding means.

14. The decoding device as claimed in claim 7, further comprising output means for reading and outputting the picture data held by the holding means,

wherein the decoding means is capable of decoding the coded stream at a speed N times the processing speed necessary for normal reproduction, and

the output means is capable of outputting the picture data of N frames each, of the picture data held by the holding means.

15. The decoding device as claimed in claim 1, further comprising:

first holding means for holding the coded stream;

reading means for reading out a start code indicating the start of a predetermined information unit included in the coded stream from the coded stream and reading out position information related to the position where the start code is held to the first holding means;

second holding means for holding the start code and the position information read out by the reading means;

first holding control means for controlling the holding of the coded stream by the first holding means and the holding of the start code and the position information by the second holding means;

selecting means for selecting predetermined picture data of the plurality of

picture data decoded and outputted by the plurality of decoding means;

motion compensation means for receiving the input of the picture data selected by the selecting means and performing motion compensation if necessary;

third holding means for holding the picture data selected by the selecting means or the picture data on which motion compensation is performed by the motion compensation means; and

second holding control means for controlling the holding, by the third holding means, of the picture data selected by the selecting means or the picture data on which motion compensation is performed by the motion compensation means, independently of the first holding control means.

16. A decoding method for decoding a coded stream, the method comprising:

a plurality of decoding steps of decoding the coded stream; and

a decoding control step of controlling the processing of the plurality of decoding steps to be carried out in parallel.

17. A recording medium having a computer-readable program recorded thereon, the program being adapted for a decoding device for decoding a coded stream, the program comprising:

a plurality of decoding steps of decoding the coded stream; and

a decoding control step of controlling the processing of the plurality of decoding steps to be carried out in parallel.

18. A program which can be executed by a computer controlling a decoding device

for decoding a coded stream, the program comprising:

- a plurality of decoding steps of decoding the coded stream; and

- a decoding control step of controlling the processing of the plurality of decoding steps to be carried out in parallel.

19. A decoding device for decoding a coded stream, the device comprising:

- a plurality of slice decoders for decoding the coded stream; and

- slice decoder control means for controlling the plurality of slice decoders to operate in parallel.

20. A decoding method for decoding a coded stream, the method comprising:

- decoding control steps of controlling the decoding by a plurality of slice decoders for decoding the coded stream; and

- a slice decoder control step of controlling the decoding control steps to be carried out in parallel.

21. A recording medium having a computer-readable program recorded therein, the program being adapted for a decoding device for decoding a coded stream, the program comprising:

- decoding control steps of controlling the decoding by a plurality of slice decoders for decoding the coded stream; and

- a slice decoder control step of controlling the decoding control steps to be carried out in parallel.

22. A program which can be executed by a computer controlling a decoding device

for decoding a coded stream, the program comprising:

decoding control steps of controlling the decoding by a plurality of slice decoders for decoding the coded stream; and

a slice decoder control step of controlling the decoding control steps to be carried out in parallel.

23. A decoding device for decoding a source coded stream, the device comprising:

a plurality of slice decoders for decoding the source coded stream for each slice constituting a picture of the source coded stream; and

control means for monitoring the decoding statuses of the plurality of slice decoders and controlling the plurality of slice decoders;

wherein the control means allocates the slices to the plurality of slice decoders so as to realize the fastest decoding processing of the picture by the slice decoders irrespective of the order of the slices included in the picture.

24. A decoding method for decoding a source coded stream, the method comprising:

a decoding processing control step of controlling the decoding processing of the source coded stream for each slice constituting a picture of the source coded stream by a plurality of slice decoders; and

a control step of monitoring the decoding statuses of the plurality of slice decoders and controlling the plurality of slice decoders;

wherein in the processing of the control step, the slices are allocated to the

plurality of slice decoders so as to realize the fastest decoding processing carried out by the slice decoders irrespective of the order of the slices included in the picture.

25. A program which can be executed by a computer controlling a decoding device for decoding a source coded stream, the program comprising:

a decoding processing control step of controlling the decoding processing of the source coded stream for each slice constituting a picture of the source coded stream by a plurality of slice decoders; and

a control step of monitoring the decoding statuses of the plurality of slice decoders and controlling the plurality of slice decoders;

wherein in the processing of the control step, the slices are allocated to the plurality of slice decoders so as to realize the fastest decoding processing carried out by the slice decoders irrespective of the order of the slices included in the picture.

26. A decoding device for decoding a source coded stream, the device comprising: a plurality of slice decoders for decoding the source coded stream for each slice constituting a picture of the source coded stream; and

control means for monitoring the decoding statuses of the plurality of slice decoders and controlling the plurality of slice decoders;

wherein the control means allocates the slice to be decoded to the slice decoder which ended decoding, of the plurality of slice decoders, irrespective of the order of the slice included in the picture.

27. A decoding method for decoding a source coded stream, the method

comprising:

a decoding processing control step of controlling the decoding processing of the source coded stream for each slice constituting a picture of the source coded stream by a plurality of slice decoders; and

a control step of monitoring the decoding statuses of the plurality of slice decoders and controlling the plurality of slice decoders;

wherein in the processing of the control step, the slice is allocated to be decoded to the slice decoder which ended the decoding processing by the processing of the decoding processing control step, of the plurality of slice decoders, irrespective of the order of the slice included in the picture.

28. A program which can be executed by a computer controlling a decoding device for decoding a source coded stream, the program comprising:

a decoding processing control step of controlling the decoding processing of the source coded stream for each slice constituting a picture of the source coded stream by a plurality of slice decoders; and

a control step of monitoring the decoding statuses of the plurality of slice decoders and controlling the plurality of slice decoders;

wherein in the processing of the control step, the slice is allocated to be decoded to the slice decoder which ended the decoding processing by the processing of the decoding processing control step, of the plurality of slice decoders, irrespective of the order of the slice included in the picture.